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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

May 15, 1997

Mr. Andrew Shively
Vermont ANR/DEC
Waste Management Division
103 South Main St. /West Building
Waterbury, VT 05671-0404

RE: Investigation of Subsurface Petroleum Contamination at Heald's Garage
Poultney, Vermont (VT DEC Site #96-2120)

Dear Mr. Shively:

Enclosed please find the summary report for the site investigation conducted at Heald's Garage in Poultney, Vermont.

Please contact me if you have any questions or comments.

Sincerely,

A handwritten signature in cursive script, appearing to read "Christine Ward".

Christine Ward
Hydrogeologist

Enclosure

c.: Mr. Dennis Boise, w/o enc.
GI#2974980

**INITIAL INVESTIGATION OF
SUBSURFACE PETROLEUM
CONTAMINATION REPORT**

**HEALD'S GARAGE
4 BEAMAN STREET
POULTNEY, VERMONT 05764**

(VT DEC SITE #96-2120)
GI #2974980

May 1997

Prepared for

CHAMPLAIN OIL COMPANY
P.O. BOX 2126
SOUTH BURLINGTON, VT 05403

Prepared by



P.O. Box 943
Williston, Vermont 05495
(802) 865-4288

TABLE OF CONTENTS

I. INTRODUCTION.....	1
II. SITE BACKGROUND.....	1
A. SITE HISTORY	1
B. SITE DESCRIPTION.....	1
C. SITE GEOLOGY	2
III. INVESTIGATIVE PROCEDURES.....	2
A. SOIL BORINGS.....	2
B. SOIL SAMPLING AND ANALYSES	3
C. GROUNDWATER FLOW DIRECTION AND GRADIENT.....	4
D. SENSITIVE RECEPTOR ANALYSIS.....	4
IV. CONCLUSIONS.....	5
V. RECOMMENDATIONS.....	5

APPENDICES

Appendix A - Maps

 Site Location Map

 Site Map

Appendix B - Soil Quality Data

I. INTRODUCTION

This report summarizes the initial investigation of subsurface petroleum contamination at Heald's Garage, Poultney, Vermont. This work was requested by Mr. Chuck Schwer of the Vermont Department of Environmental Conservation (VTDEC) in a letter to Mr. Dennis Boise of Champlain Oil Company (COCO) dated February 4, 1997. This work was performed in accordance with the February 20, 1997, *Work Plan and Cost Estimate for Investigation of Subsurface Petroleum Contamination* for the site prepared by Griffin, and approved by Mr. Andrew Shively (VTDEC) in a letter to Mr. Dennis Boise on February 25, 1997.

II. SITE BACKGROUND

A. Site History

Subsurface petroleum contamination was detected in the vicinity of the fuel dispenser island during soil field screening at a routine UST system piping replacement on December 17, 1996. The piping was reportably in excellent condition, with no evidence of leaks such as holes, loose joints, or staining of soils. Soil samples collected during the piping replacement were screened for volatile organic compounds (VOCs) using an HNu™ systems Model PI 101 photo ionizing detector (PID). Very low VOC concentrations (0.4 to 1.1 ppm) were detected at the UST suction piping connections and along the piping trench. VOC concentrations in the soils near the fuel dispenser island ranged from 290 parts per million (ppm) directly below the fuel dispenser island to 18.5 ppm at 5.5 feet below grade. As a result of the petroleum contamination detected in the subsurface below the fuel dispenser island, the VTDEC requested that additional work be conducted at the site in order to determine the extent and degree of petroleum contamination.

B. Site Description

The subject property is a Citgo gasoline service station, consisting of one building and a fuel dispenser island. The one story building has a concrete slab on grade foundation with no basement. There are two service bays in the north end of the building.

The site is located at northwest corner of the intersection of Beaman Street (Vermont Route 30) and Main Street (Vermont Route 140). To the east is a parsonage and a church. To the southeast, diagonally across the intersection, is a Mobil service station. To the south are residences and businesses. The site is bordered on the west by the Howe House, a former nursing home. The site is bordered to the north by Williams Machine Company, which does specialty and custom machine work.

The nearest surface water is a small unnamed brook approximately 100 feet east of the site, on the opposite side of Beaman Street. The brook flows southwest and is diverted under the intersection of Beaman and Main Streets through a concrete culvert. The brook discharges into the Poultney River approximately 0.5 mile downstream. The entire area is served by public water and septic systems.

C. Site Geology

Soils in the vicinity of the UST system piping during the removal inspection consisted primarily of dry, well sorted medium to coarse sand with some medium gravel and silt. According to the Surficial Geologic Map of Vermont (Ref. 1), the site is underlain by glaciolacustrine littoral sediment, predominantly gravel. Bedrock below the site is mapped as the Pawlet Formation consisting of silver gray to jet black micaceous silty slate; interbedded, at intervals of a few inches to tens of feet, by beds of dark gray rusty weathered graywacke a few inches to 6 feet thick. (Ref. 2).

III. INVESTIGATIVE PROCEDURES

To further define the extent of subsurface petroleum contamination in the area of the fuel dispenser island, the following investigative tasks were undertaken: soil borings, and soil sample collection and analyses for petroleum related constituents.

A. Soil Borings

Three soil borings (SB-3, SB-4, and SB-5) were drilled on March 24, 1997, by Adams Engineering, under the direct supervision of a Griffin hydrogeologist. The soil borings were advanced with a truck mounted vibratory soil core sampler. No monitoring wells were installed in the borings because refusal was encountered at shallow depths with no evidence of groundwater. The soil boring locations are indicated on the Site Map (Appendix A).

Soil boring SB-3 was located approximately 30 feet south of the fuel dispenser island and east of the USTs. Soil boring SB-4 was located directly east of the fuel dispenser island, close to the source area. Soil boring SB-5 was located near the service station, approximately 25 feet northwest of the fuel dispenser island.

Undisturbed soil samples, collected from the boring with the sampler, were logged by the supervising hydrogeologist and screened for the presence of volatile organic compounds (VOCs) using an HNu™ systems Model PI 101 photo ionizing detector (PID). Prior to

screening, the PID was calibrated with isobutylene referenced to benzene. Soils were screened using the Griffin Jar/Polyethylene Bag Headspace Screening Protocol, which conforms to state and industry standards.

Soils encountered in soil boring SB-3 were predominately dry to damp, loose, brown gravel with some sand and silt. The soil sample collected from the augers from 5 feet to 9.5 feet below grade had a VOC reading of 0.3 parts per million (ppm), and was transferred to a sample jar for submittal to the laboratory for analysis. Refusal was encountered at 9.5 feet below grade.

Soils encountered in soil boring SB-4 from 0 to 5 feet below grade consisted of damp, loose, brown sand with some silt, gravel, and purple slate rock fragments. The soil sample collected from this section had a VOC reading of 9.8 ppm. The soil sample collected from 5 to 6 feet below grade consisted of damp to moist, brown silt and gravel with trace amounts of sand and clay, and had a VOC reading of 15 ppm. The vibratory sampler hit refusal at 6 feet below grade, so the soil boring was advanced by augering to 10.5 feet below grade. Soil collected from the auger was dry to damp, gray silt with little gravel and trace sand. The sample collected from the auger had a VOC reading of 10 ppm, and was transferred to a sample jar for submittal to the laboratory.

Soils encountered in soil boring SB-5 from 0 to 10 feet below grade consisted of dry to damp, loose, brown sand and gravel, with some silt. The soil sample collected from 0 to 5 feet below grade had a VOC reading of 1.6 ppm, and the soil sample collected from 5 to 10 feet below grade had a VOC reading of 3 ppm. From 10 to 11.5 feet below grade, when refusal was encountered, the soils consisted of moist to wet, gray-brown sand and slate rock fragments. A petroleum odor was detected from this soil sample, and there was some black staining. This soil sample had a VOC reading of 140 ppm, and was transferred to a sample jar for submittal to the laboratory.

B. Soil Sampling and Analyses

Soil samples collected on March 24, 1997, from the bottom of the three borings were placed in 250 ml brown glass jars and kept cool until delivered to laboratory. The soil samples were analyzed by Endyne, Inc. of Williston, Vermont, for EPA Method 8020 compounds (benzene, toluene, ethylbenzene, and xylenes (BTEX) and methyl tertiary butyl ether (MTBE)) by EPA Method 8260. Results of the laboratory analyses for the soil borings are summarized in Appendix C. The laboratory analysis report is also in Appendix C.

Analysis of the soil sample collected from SB-3 indicated trace concentrations of ethylbenzene and toluene, and a low concentration of xylenes, all below their applicable groundwater standards.

Analysis of the soil sample collected from SB-4, located near the source area, indicated concentrations of benzene and xylenes exceeding their applicable groundwater standards. Ethylbenzene and toluene were also detected in this sample, below their applicable groundwater standards.

Analysis of the soil sample collected from SB-5 indicated a trace concentration of ethylbenzene and a low concentration of xylenes, below their applicable groundwater standards.

C. Groundwater Flow Direction and Gradient

The tank pit monitoring wells, MW-1 and MW-2, could not be located on March 24, 1997, because they were buried under a snowbank from the winter plowing activities.

On April 18, 1997, the monitoring wells were located and gauged for the presence of the water table. The measured water table in MW-1 was 9.65 feet below ground surface (bgs), and the total depth of the well was 10.25 feet bgs. A sample was not collected from MW-1, as this water is likely trapped in the endcap and is not representative of the water table. No water table was observed in MW-2, with the total depth of the well being 9.0 feet bgs. Both tank pit monitoring wells were constructed of 4 inch diameter, continuous slot PVC.

Since refusal was encountered in the soil borings before the water table, there is insufficient data to make a judgment on the groundwater flow direction in the overburden. Regionally, the estimated groundwater flow direction is south-southwest toward the Poultney River.

D. Sensitive Receptor Analysis

A receptor risk assessment was conducted to identify known and potential receptors of the contamination detected at the Heald's Garage site. A visual survey was conducted at the time of the UST piping replacement inspection, as well as during the soil borings. Based on these observations, a determination of the potential risk to identified receptors was conducted.

The entire area is served by municipal water and sewer systems. No in-use public or private water supply wells were identified in the vicinity of the site, based on visual observation and interviews with site representatives.

The nearest surface water is a small unnamed brook, approximately 100 feet east of the subject property. No visual signs of petroleum impact were observed on the day of the piping replacement or on the day of the soil borings.

The soil in the immediate vicinity of the fuel dispenser island is a potential sensitive receptor. The risk to this sensitive receptor is minimal, based on the very low to non-detect BTEX concentrations in the soil samples collected at the site.

Heald's Garage is slab on grade construction and the area surrounding the fuel dispenser island is paved, thus the risk due to vapors is minimal

IV. CONCLUSIONS

Based on the results of this investigation, Griffin presents the following conclusions:

1. There was a release(s) of gasoline to the subsurface in the vicinity of the fuel dispenser island. The amount of the release(s) is unknown. Since the piping and connections were reported to be in excellent condition at the time of the replacement, it is likely that the detected contamination is the result of small spills during routine maintenance of the pumps and during the dispensing of gasoline.
2. VOC readings of soils indicate that low levels of adsorbed petroleum compounds exist in the soils in the immediate vicinity of the fuel dispenser island. It is expected that adsorbed petroleum compound concentrations will continue to decrease over time with the progressive action of natural mitigative processes, including biodegradation, volatilization, and diffusion.
3. Refusal was encountered at approximately 10 feet below grade on March 24, 1997. The water table was not observed in the soil borings or in the two tank pit monitoring wells.

V. RECOMMENDATIONS

Based on the conclusions presented above Griffin recommends that the Heald's Garage site in Poultney, Vermont be considered for closure and be removed from the VTDEC Active Hazardous Waste Sites List. This recommendation is offered based upon achievement of the following closure criteria, as per the VTDEC Site Management Activity Completed (SMAC) Checklist:

- 1) The source(s), nature, and extent of the petroleum contamination at the site has been adequately defined.

The source of petroleum contamination detected in soils under the fuel dispenser island at the Heald's Garage site was likely the result of small gasoline spills from

the fuel dispensers. The extent of the contamination is largely contained to the vicinity of the fuel dispenser island.

The water table was not observed in the soil borings or in the tank pit monitoring wells. Refusal was encountered at approximately 10 feet below grade.

The very low VOCs (0.4 to 1.1 ppm) were detected with the PID in the UST piping trench and near the piping connection to the USTs when the piping was replaced on December 17, 1996.

- 2) Source(s) has been removed, remediated, or adequately contained.

Adsorbed petroleum contamination continues to exist in the vicinity of the fuel dispenser island. It is expected that remaining adsorbed petroleum concentrations in the soil will continue to decrease over time with the progressive action of natural mitigative processes.

The area around the fuel dispenser island is paved, thus the impact of vapors will be minimal.

- 3) Levels of contaminants in soil and groundwater shall be stable, falling, or non-detectable.

The detected BTEX concentrations in the soil are all below the applicable groundwater standards, except for benzene and xylenes in the vicinity of the fuel dispenser island. Remaining adsorbed petroleum concentrations in the soil will likely continue to decrease over time with the progressive action of natural mitigative processes.

- 4) Groundwater enforcement standards are met on entire property.

Groundwater was not observed in the soil borings. Refusal was encountered at a depth of 10 feet below grade.

- 5) Soil guideline levels are met. If not, engineering or institutional controls are in place.

The detected BTEX concentrations in the soil are all below the applicable groundwater standards, except for benzene and xylenes in the vicinity of the fuel dispenser island.

The area around the fuel dispenser island is paved, thus the impact of vapors will be minimal. Remaining adsorbed petroleum concentrations in the soil will likely continue to decrease over time with the progressive action of natural mitigative processes.

- 6) No unacceptable threat to human health or the environment exists on site.

Drinking water in Poultney is supplied by a municipal source. There are no on-site supply wells at the subject property or any immediately adjacent properties.

The small unnamed brook and the soil are the only identified potential receptors at the site. Based on visual observations of the brook, there appears to be no significant impact to the brook. Remaining adsorbed petroleum concentrations in the soil will likely continue to decrease over time with the progressive action of natural mitigative processes. There are no other receptors in the area that appear to be at significant risk of petroleum contamination from the subsurface petroleum contamination detected at the site.

- 7) Site meets RCRA requirements.

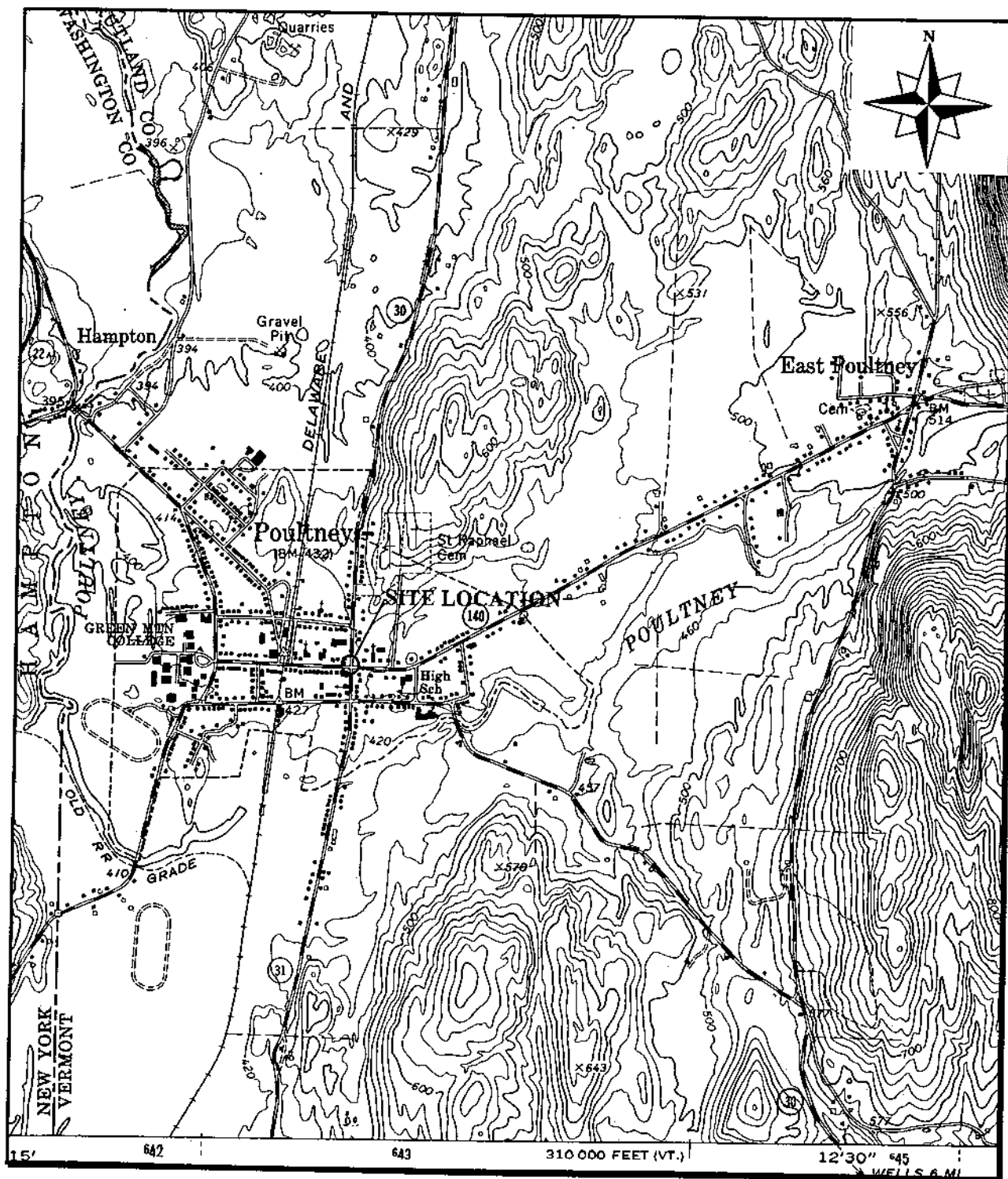
Available records indicate that the Heald's Garage site is not in violation of the Resource Conservation and Recovery Act (RCRA) as defined in 40 CFR 264.

- 8) Site meets CERCLA requirements.

Available records indicate that the Heald's Garage site is not in violation of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as defined in 40 CFR 300.

APPENDIX A

**Site Location Map
Site Map**

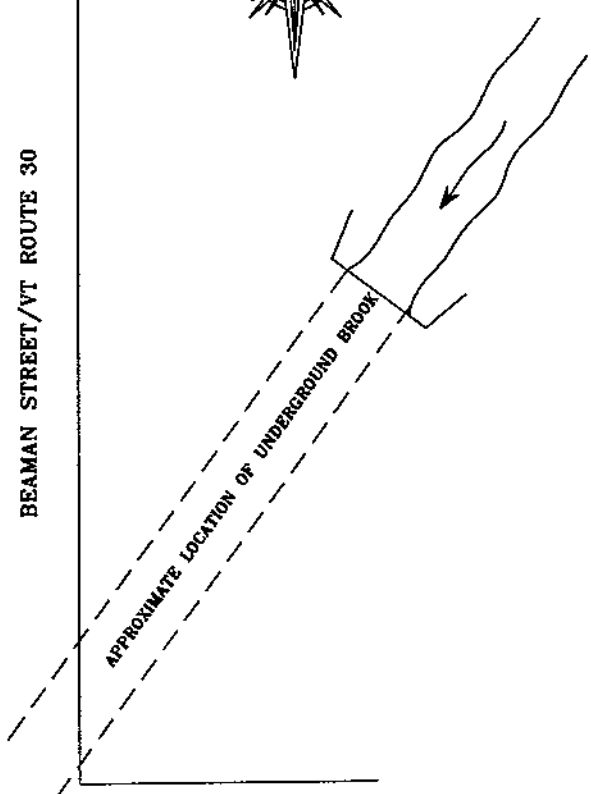
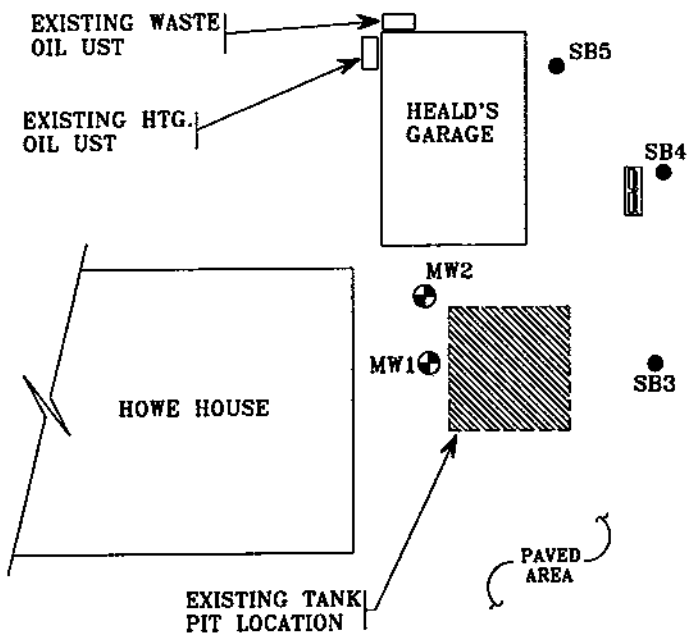


Site Location Map - Heald's Garage

Poultney, Vermont

Base Map: USGS Poultney, VT-NY Quadrangle 1964, photorevised 1972



Scale 1:24,000



MAIN STREET/VT. ROUTE 140

BEAMAN STREET/VT ROUTE 30

LEGEND

-  MW2 MONITORING WELL
-  SB3 SOIL BORE

JOB #: 2974980
SITE MAP DERIVED FROM SITE SKETCH INFORMATION AND SURVEY DATA.



HEALD'S GARAGE			
POULTNEY,		VERMONT	
SITE MAP			
DATE: 3/27/97	DWG.#:2	SCALE: 1"=40'	DRN.:SB APP.:CW

APPENDIX B

Soil Quality Data

SOIL SAMPLE SUMMARY

HEALD'S GARAGE POULTNEY, VERMONT

Sample Date: 3/24/97

PARAMETER	SAMPLE LOCATION			Applicable Standard (ppb)
	SB-3 5' - 10'	SB-4 5' - 10'	SB-5 10' -11.5'	
Benzene	ND > 10	231.	ND > 50	5. a
Chlorobenzene	ND > 10	ND > 10	ND > 50	100. a
1,2-DCB	ND > 10	ND > 10	ND > 50	600. b
1,3-DCB	ND > 10	ND > 10	ND > 50	600. c
1,4-DCB	ND > 10	ND > 10	ND > 50	75. a
Ethylbenzene	TBQ < 10	248.	TBQ < 50	680. d
Toluene	TBQ < 10	537.	ND > 50	1,000. b
Xylenes	41.1	1,600.	154.	400. d
Total BTEX	41.1	2,616.	154.	-
MTBE	ND > 20	ND > 20	ND > 100	40. c
BTEX+MTBE	41.1	2,616.	154.	-

Analysis by EPA Method 8020 Compounds by EPA Method 8260, values reported in ug/kg (ppb)

ND>1 - None Detected above Detection Limit

TBQ<1 - Trace Below Quantitation Limit

MCL - E.P.A. Maximum Contaminant Level

HAL - Health Advisory Level

VGES - Vermont Groundwater Enforcement Standard

a - MCL and VGES

b - MCL

c - HAL

d - VGES



ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

REPORT OF LABORATORY ANALYSIS

CLIENT: Griffin International
PROJECT NAME: Heald's Garage
DATE REPORTED: April 4, 1997
DATE SAMPLED: March 24, 1997

PROJECT CODE: GIHG1483
REF. #: 101,263 - 101,265

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody record.

Chain of custody did not indicate sample preservation.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy were monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate data was determined to be within Laboratory QA/QC guidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures



ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Griffin International
PROJECT NAME: Heald's Garage
REPORT DATE: April 4, 1997
SAMPLER: Chris Ward
DATE SAMPLED: March 24, 1997
DATE RECEIVED: March 26, 1997

PROJECT CODE: GIHG1483
ANALYSIS DATE: March 31, 1997
STATION: SB-3
REF.#: 101,263
TIME SAMPLED: 12:00

<u>Parameter</u>	<u>Detection Limit</u> <u>As Received (ug/kg)</u>	<u>Concentration</u> <u>As Received (ug/kg)</u>
Benzene	10	ND ¹
Chlorobenzene	10	ND
1,2-Dichlorobenzene	10	ND
1,3-Dichlorobenzene	10	ND
1,4-Dichlorobenzene	10	ND
Ethylbenzene	10	TBQ ²
Toluene	10	TBQ
Xylene	20	41.1
MTBE	20	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: >10

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	93.%
Toluene-d8:	92.%
4-Bromofluorobenzene:	102.%

PERCENT SOLIDS: 95.%

NOTES:

- 1 None detected
- 2 Trace below quantitation limit



ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Griffin International
PROJECT NAME: Heald's Garage
REPORT DATE: April 4, 1997
SAMPLER: Chris Ward
DATE SAMPLED: March 24, 1997
DATE RECEIVED: March 26, 1997

PROJECT CODE: GIHG1483
ANALYSIS DATE: March 31, 1997
STATION: SB-4
REF.#: 101,264
TIME SAMPLED: 10:15

<u>Parameter</u>	<u>Detection Limit</u> <u>As Received (ug/kg)</u>	<u>Concentration</u> <u>As Received (ug/kg)</u>
Benzene	10	231.
Chlorobenzene	10	ND ¹
1,2-Dichlorobenzene	10	ND
1,3-Dichlorobenzene	10	ND
1,4-Dichlorobenzene	10	ND
Ethylbenzene	10	248.
Toluene	10	537.
Xylene	20	1,600.
MTBE	20	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: >10

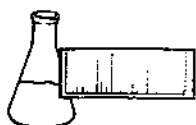
ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	103.%
Toluene-d8:	93.%
4-Bromofluorobenzene:	100.%

PERCENT SOLIDS: 96.%

NOTES:

1 None detected



ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Griffin International
PROJECT NAME: Heald's Garage
REPORT DATE: April 4, 1997
SAMPLER: Chris Ward
DATE SAMPLED: March 24, 1997
DATE RECEIVED: March 26, 1997

PROJECT CODE: GIHG1483
ANALYSIS DATE: March 31, 1997
STATION: SB-5
REF.#: 101,265
TIME SAMPLED: 2:00

<u>Parameter</u>	<u>Detection Limit</u> <u>As Received (ug/kg)¹</u>	<u>Concentration</u> <u>As Received (ug/kg)</u>
Benzene	50	ND ²
Chlorobenzene	50	ND
1,2-Dichlorobenzene	50	ND
1,3-Dichlorobenzene	50	ND
1,4-Dichlorobenzene	50	ND
Ethylbenzene	50	TBQ ³
Toluene	50	ND
Xylene	100	154.
MTBE	100	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: > 10

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	97.%
Toluene-d8:	91.%
4-Bromofluorobenzene:	102.%

PERCENT SOLIDS: 91.%

NOTES:

- 1 Detection limit increased due to high levels of non-target contaminants. Sample run at a 20.% dilution.
- 2 None detected
- 3 Trace below quantitation limit



32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

CHAIN-OF-CUSTODY RECORD

GI# 2974980

18505

Project Name: <i>Heald's Garage</i>	Reporting Address: <i>Griffin</i>	Billing Address: <i>Griffin</i>
Site Location: <i>Pawtney, VT</i>		
Endyne Project Number: <i>GIHG 1483</i>	Company: <i>Griffin</i>	Sampler Name: <i>Chris Ward</i>
	Contact Name/Phone #: <i>Chris Ward 865-4288</i>	Phone #: <i>865-4288</i>

[illegible]

Relinquished by: Signature <i>Christie E Ward</i>	Received by: Signature <i>Angela Lacey</i>	Date/Time <i>3/26/10 10:00 am</i>
Relinquished by: Signature <i>Angela Lacey</i>	Received by: Signature <i>M. Funn</i>	Date/Time <i>3/26/17 10:40 am</i>

New York State Project: Yes No **X**

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD ₅	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										